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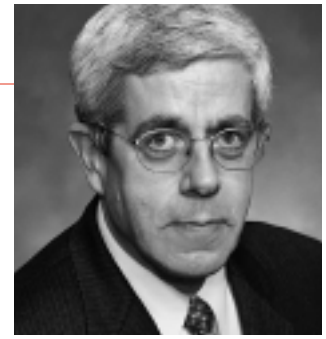
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Graduate Medical Education and Patient Safety

High-quality education and safe patient care provide an organizing framework for the ACGME standards and accreditation activities. This issue of the Bulletin features articles at the interface between physician education and development and patient safety, examining the topic from a pragmatic and a philosophical perspective. The authors discuss efforts in teaching settings to enhance patient safety through education (Gosby et al. and Grande and Volpp); a novel application of the morbidity and mortality conference (Russell); a statewide initiative to educate health care providers about safety (Barach); and thoughtful applications of the general competencies to resident education (Leach) and the ongoing development of practicing physicians (Geheb et al). Collectively, they remind us that, beginning with Ernest Codman's efforts to improve surgical patient safety, the work of accreditation in health care is intricately linked to the goal of safe care. For ACGME this connection is twofold: contributing to safe care in teaching settings and ensuring that the next generation of physicians understands how to ensure the safety of their patients. ■

Correction: ACGME News

In the Spring 2004 issue, the title for Dr. Jeanne Heard in the article announcing her start in her new position was listed incorrectly. Dr. Heard is the Director of RRC Activities.



Competence and Safety: the Yin and Yang of Good Patient Care

David C. Leach, MD

A 1904 fire in Baltimore demonstrated the point. After local efforts proved inadequate fire engines were called in from Washington and arrived within three hours by special train only to find that their hoses did not fit the Baltimore hydrants. Additional units were called in from New York, Philadelphia, Annapolis, Wilmington, Harrisburg, and other cities and found that they too were forced to watch helplessly as 1526 buildings and 70 city blocks were consumed. Fire hoses and hydrants were not standardized. Thirty hours later the fire went out by itself.¹

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The insurance industry and the fire protection associations had been calling for standard couplings for all fire departments; they had spoken out consistently since the mid 1800's – but their voices went unheeded. At the time of the fire there were more than 600 sizes and variations in fire hose couplings, the result of a patchwork of local and regional standards.

Closer to home – a parenteral nutrition order for an infant was supposed to contain injectable calcium gluconate. The infant's calcium did not increase with treatment, however, the magnesium did. Subsequent investigation revealed that the pharmacy had erroneously used magnesium sulfate instead of calcium gluconate. Both products came in glass vials with purple and blue labels and purple snap-off vial caps.² There are no national standards that requires that all magnesium vials be of one color and all calcium vials of another.

Hospitals have a patchwork of locally developed systems of care. Residents are experts in these local systems – they have to be in order to survive. In one pocket they have a Washington Manual, and in the other, a set of notes describing how to get things done in their particular patient care setting. Some of these systems relate to patient safety; residents know what parts of the local system can be trusted and what parts can't. They compensate for the broken systems by trying harder, but in the long run that doesn't work; the systems need to become a system and the system needs to be redesigned.

What is the relationship between individual competency and safe patient care? They are yin and yang: one is a necessary part of the other, yet they have different, even

opposite, operating principles. Safety is best when applied across the board; patient care is best when customized. Safety is helped by universal rules; individual competence is fostered by an understanding of universal rules, but is only brought to fruition by a deepening of individual values. Safety is based on science; medicine is an art that uses science. In the Glouberman and Zimmerman model safety is a simple and complicated phenomenon; individual competence is complex.³ Safe systems are designed to function without human intervention when possible; competence depends deeply on human engagement.

Yet this apparent polarity is a bit of a ruse. Ignaz Semmelweis observed that women whose delivery was performed by physicians had a much higher rate of puerperal fever and death than did women delivered by midwives (18% vs. 2%). Doctors did autopsies and midwives did not. He suggested that doctors should wash their hands. Women delivered by doctors who washed their hands had a mortality rate of 2%. Of note, Semmelweis was denied an academic promotion and was no longer allowed to teach because his superiors felt that hand washing was not important. Semmelweis went from place to place urging hand washing, but few listened and he died in an insane asylum at age 47.⁴

Hand washing is one example of many in which safe systems depend on human factors. It is part of individual competence; good physicians acquire the habit of washing their hands. Yet even here local system factors are important. If sinks, soap, and paper towels are not easily available, otherwise good physicians may soon tire of walking long distances after each patient to wash their hands.

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All six of the ACGME competencies relate in some way to patient safety. Residents should be able to demonstrate that they can gather accurate information about the patient, that they know the cognate science of safety, that they can do a root cause analysis in the analysis of errors. They should demonstrate patterns of communication that promote safety, as well as the professionalism needed to tell the truth about how safe the system is. However, it is probable that systems-based practice is the competence in which safety is most prominently featured. It is here that skills can be acquired to design safer

systems. Naming the parts of the local system that are broken, portfolios of near misses related to system issues, the frustrations of dealing with a broken system constitute much of the stuff of residency. Needed is the skill set to do the work of improvement, a work that almost always invokes conversations with other health professionals. The design of safer systems comes in three flavors: design features that are automatically employed (e.g. standardized colors of canisters of anesthetic gases); design features that are local and somewhat dependent on human factors (e.g. using marker pens to avoid wrong site surgery); and those elements that depend deeply on individual accountability (e.g. hand washing). Designing improvements at the local level provide rehearsals that can begin the journey to improvement of the more global system.

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Not everyone was deaf to Semmelweis’ harangues about hand washing. A number of younger faculty listened, and those faculty became the leaders of the next academic generation – a generation that would create the great teaching hospitals of Europe in the 1800s. Let’s hope that the residents of today may have a similar fate. They know the current system is broken and they are hungry for the skills needed to fix it. We all must help them. The task is broader than yin or yang; it must include both. ■

¹ Cochrane, Raymond E. Measures for progress. A history of the national bureau of standards. Washington, D.C. U.S. Department of Commerce. 84-6, 1966.

² USP Patient Safety CAPSLink, www.usp.org/pdf/patientsafety/capslink2004 February 2004.

³ Glouberman S. and Zimmerman B. Complicated and complex: The reform of Medicare in Canada; discussion paper number 8, The Commission on the Future of Healthcare in Canada. 2002.

⁴ Best, M. and Neuhauser, D. Ignaz Semmelweis and the birth of infection control. *Quality and safety in health care*. 13, 233-234, June, 2004.

PRELIMINARY REPORT

Looking Towards a Model of Organizational Performance: Can Health Systems Professionalism and Competence be defined?

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Public attention to clinical quality has been increasing in the recent past, especially with the publication of a series of Institute of Medicine (IOM) reports, including *To Err is Human*,¹ *Crossing the Quality Chasm*,² *Envisioning the National Health Care Quality Report*,³ *Health Professions Education: A Bridge to Quality*,⁴ and *Patient Safety: Achieving a New Standard for Care*.⁵ The IOM described the American health system as lacking in clarity of purpose without a commonality of interests, and not having the shared values necessary to guide the various constituents – from patients to health professionals to policy makers – in support of system wide performance. Educators have responded by calling for general reform of medical education,^{4,6} and there have been renewed discussions in segments of the health care community of how professionalism might drive reformation of the American health system.^{7,8,9}

To date these discussions within professional groups have by and large occurred independently, although the American Board of Internal Medicine (ABIM) charter on professionalism has generated interest well beyond the internal medicine community.⁷ The charter states that physicians need to be “working collaboratively with other professionals to reduce medical error, as well as increase patient safety, minimize overuse of health care resources, and optimize the outcomes of care”. Medical professionalism has traditionally focused on the individual physician-patient relationship without reference to the roles of other health disciplines in the provision of quality care. Recently, Brennan introduced the concept of “civic professionalism” which calls for systematic quality measurement and improvement as an obligation of the medical professional.⁸ In his 1999 and 2003

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presidential addresses for the American Association of Medical Colleges (AAMC), Dr. Jordan Cohen called for a model of “collaborative care” among health disciplines to improve the patient care experience.^{10,11} We suggest that the concept of professionalism needs to be broadened to recognize that interdisciplinary training and practice is a requirement for the delivery of high quality healthcare.

In response to these discussions, increasing expertise in quality improvement (QI) is now developing in American health care institutions led by organizations such as the Institute for Health Improvement (IHI), and in the academic community by the University HealthSystem Consortium (UHC). The Association of American Medical Colleges (AAMC) in partnership with IHI has created the Center for Health Improvement to introduce QI principles into medical education. The IHI is focusing on performance improvement for healthcare teams and their interactions with patients and their families (microsystems of care), while UHC is developing tools for reporting and benchmarking clinical, operating, and financial outcomes of care in hospitals and their ambulatory care operations. The IOM has defined qualifying aims (IOM aims; **Table 1**) for health care providing a descriptive framework for setting standards and measuring outcomes.² These aims are based on three pillars: scientific evidence; well-designed systems; and patient centered care.⁶ In Envisioning the National Health Care Quality Report,³ the IOM provides a more detailed roadmap for measuring individual patient and population outcomes. With these and other activities, the chaotic transformation of the American health care system is underway.

Table 1: IOM Aims for Health Care

- **Safe** – avoiding injuries to patients from the care that is intended to help them.
- **Effective** – providing services based on scientific knowledge to all who could benefit and refraining from providing services to those unlikely to benefit (avoiding under use and overuse).
- **Patient-centered** – providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions.
- **Timely** – reducing waits and sometimes harmful delays for both those who receive and those that give care.
- **Efficient** – avoiding waste, including waste of equipment, supplies, ideas, and energy.
- **Equitable** – providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socio-economic status.

In Health Professions Education: A Bridge to Quality, the IOM recommends “all health professionals should be educated to deliver patient-centered care as members of an interdisciplinary team,” and points out “the lack of consensus across the professions around language and terms related to the core competencies may be undermining their integration into oversight processes.”⁴ The report defines a set of competencies that should be common to all health disciplines, including: providing patient-centered care; working in interdisciplinary teams; employing evidence based practice; applying quality improvement; and utilizing informatics. We suggest that central to a health system committed to continuous QI be a transition to a “culture of quality” in which interdisciplinary teams embrace the IOM aims and core competencies. In this renewed practice and teaching environment, healthcare providers with a set of individual disciplinary yet synergistic values and competencies will share

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a common language with interlocking skill sets. Understanding the interrelationships of the values and competencies for the various professional disciplines should help define specific roles and responsibilities of individual team members, and also the performance characteristics of a successful team “culture.” The common language for values and competencies would allow for the definitions of “systems professionalism” and “systems competence.” In any human organization “culture trumps strategy” every time, and for sustained results developing a “culture of quality” will be necessary.

In a previous article based on work at Oregon Health & Science University (OHSU), Dickey, et al. described an institutional process for integrating knowledge of the six IOM aims into the Accreditation Council for Graduate Medical Education (ACGME) core competency categories.¹² In the course of this work, it became clear that there was insufficient understanding of the ACGME competencies and the IOM aims to share a common language, which was a barrier to implementing the competencies. Additionally, there was concern that the ACGME competencies did not clearly acknowledge the IOM aims, and while systems based care is an explicit ACGME competency for physicians, there was little understanding of the inter-relationships of competencies across health care disciplines, and how those relationships might enhance or inhibit the functioning of interdisciplinary health care teams. Concurrently, OHSU nursing leadership with the Oregon Nursing Leadership Council (ONLC) was

redesigning nursing education, and revising nursing competencies to deal with a critical nursing shortage and to meet future health care needs of Oregonians.¹³ This group, and later the Oregon Consortium of Nursing Education, have been targeting the core importance of enhanced competencies and skills in team function, leadership, use of evidence in day to day practice and professional communications.

Against this background, we looked first to create a value set for “system professionalism” that would resonate across the boundaries of the disciplines. Then, widening our scope we began to examine the language of the competencies across a broad set of healthcare disciplines (medicine, nursing, pharmacy, dentistry and social work) cross referencing them to the language of the IOM aims and competencies – looking to how “system competence” might be defined. Our goal is to develop working documents with a common language embracing the values of a variety of stakeholders, creating a framework to inform educational goals, and further refine competencies and their inter-relationships. With this accomplished, roles and responsibilities can be defined and evaluation tools can be created to reinforce the positive interdisciplinary team behavior required for a “culture of quality.” The resulting patient-centered interdisciplinary team model guided by the IOM aims would apply to the lived experiences of patients and healthcare providers. This initial report is centered at the bedside and is based on day-to-day health care team experiences with patients.

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Initially, we evaluated the similarities (and differences) in definitions of professionalism, including that defined by the ACGME,¹⁴ looking for common ground language that was inclusive of the values of each health discipline, but which also united and transcended disciplinary boundaries. Our review of the professionalism literature across disciplines culminated in conceptualizing professionalism in five domains. We believe these domains integrate and incorporate professionalism as described by nursing, medicine, dentistry, pharmacy, and social work, including:

Knowledge Acquisition and Application: Each discipline is distinguished by the accumulation and application of the knowledge base that defines it as a discipline. Embedded in each discipline’s knowledge base is the commitment of professionals within the discipline to pursue self-directed and life-long learning and the responsibility to inform and teach others.

Responsibility to the primacy of the patient and also the larger social system: The second domain acknowledges that healthcare providers are charged with these dual and sometimes conflicting responsibilities. The social system can be conceptualized as having three levels: Micro (patients, families, and teams), mezzo (the hospital and community), and macro (local, national, and world). Responsible management of resources includes people, money, time, equipment, and other resources.

Access to Equitable care: The duty to advocate for access to equitable health care is fundamental to our value of fairness and respect for all human beings. Healthcare professionals must provide the best care possible irrespective of race, cultural background, gender, and economic social class, recognizing that the resources available to any given patient vary considerably given the inequities of the American social system.

Intrapersonal and Interpersonal Communication: It is imperative that healthcare professionals learn to utilize respect, integrity, and compassion in self-reflection, self-management, and relationship management in regards to interdisciplinary team functioning as well as caring for the individual patient. Professional behavior must be responsible and sensitive to the needs of individuals and social contexts in patient care and training environments.

Ethical Reasoning and Behavior: Healthcare professionals must be able to recognize, analyze, and manage ethical conflicts arising in clinical, teaching, and research settings. Familiarity with ethical principles can aid understanding of conflicting values and priorities. Decisions and behaviors in these settings should reflect ethical reasoning. Ethical principles need to guide difficult decision making especially in circumstances in which resources available to an individual patient are constrained.

With these professional value domains as a guide, we then assembled for comparison the competencies for the disciplines of medicine, nursing, dentistry, pharmacy, and social work. We have been surprised by several preliminary findings not the least of which is working through the tangle of documents of various licensing, accrediting, and certification agencies.^{4,6} The ACGME competencies in medicine were easy to select since they are universal for training in the United States. For the other disciplines, the selection was less easy and we finally chose those that apply in the state of Oregon. In addition to the ACGME competencies for medicine,¹⁴ we selected those defined by the Oregon Nursing Leadership Council,¹⁵ the Accreditation Standards for Dental Education Programs of the American Dental Association¹⁶ the American Society of

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Table 2: IOM word count in the competencies

	Total	Nursing	Medicine	Dentistry	Pharmacy	Social Work
Safe	3	2	0	1	0	0
Effective	42	26	9	3	4	0
Efficient	4	3	0	0	1	0
Timely	2	1	0	0	1	0
Patient-centered	0	0	0	0	0	0
Equitable	0	0	0	0	0	0

Health-System Pharmacists,¹⁷ and the National Association of Social Workers Scope of Practice and Code of Ethics.¹⁸ A review of legal scope of practice documents by discipline in Oregon lead us to conclude that, as they stand, they do not inhibit development of a common language for the competencies.

We then performed a count in which the actual words – **safe, effective, efficient, timely, patient-centered, and equitable** – were searched for in the competencies (**Table 2**). The words **patient-centered** and **equitable** did not appear in any of the competencies. The word **timely** appeared twice, once for nursing and once for pharmacy. The word **safe** appeared three times, once in dentistry and twice in nursing. It is absent in the medicine and pharmacy competencies. The word **efficient** appeared four times, three times for nursing and once for pharmacy. On the other hand, the word **effective** appeared a total of forty-two times; twenty-six times for nursing, nine times for medicine, three times for dentistry, and four times for pharmacy.

With the public attention to patient safety and medication errors in the last several years, we were surprised that the word **safety** does not appear in the medicine and pharmacy competencies, the professional disciplines prescribing and dispensing drugs. The word **effective** appears most frequently and can be often interpreted as cost-efficiency. When used, it does not consistently imply the IOM definition, for care to be based on scientific knowledge (evidence-based) and to avoid the under- and over- use of resources, although the ACGME competency of “systems-based practice” does incorporate language using the terms “system resources”, “value” and “controlling health care costs.” The term **patient-centered** does not appear at all. While there are references to

patient preferences, needs, and values, there is no reference to the “patient as the center of control,” a recurring theme of the IOM. In its definition the IOM does not include this phrase, suggesting that the IOM definition may need to be modified. The word **timely** appears twice, once each for nursing and pharmacy. Given the time sensitivity of many therapies and the requirement for coordinated interdisciplinary teamwork to achieve

good clinical outcomes, it was quite surprising that a sense of timeliness is not a fundamental term found in the competencies. The term **efficient** is used four times and does not convey the IOM’s sense of avoiding waste. The word **equitable** is absent. Its sense as defined by the IOM does appear in the competencies but there is little recognition by the IOM that patients have differing resources available to them and that at a practical level, health providers have to work within the resources available to the patient. We have attempted to address this concept of “resources available to the patient” in the professional values statements for **Access to Equitable Care and Ethical Reasoning and Behavior**. Given the intrinsic inequities of the American health care system, and the ethical dilemmas it presents, we suggest that more defining work in the area of **equitable** care is required.

We have also begun to look at how the correlation of specific competencies across disciplines. As a start, the categories for medicine and nursing were compared side by side in **Table 3**. While there is a correlation, the language of the major headings and the content of the competencies do not fully align, suggesting that a glossary of terms might aid common understanding across disciplines. We have initiated an exercise with a larger group of health practitioners across disciplines* to judge how well the language of the competencies encompass the specific definitions of the IOM aims, and to make recommendations for any language changes that might apply across disciplines. Our assumption is that the clear insertion of terms referring to IOM aims (and competencies) could lead to a common language for interdisciplinary teams. Later goals will include using the common language to revise job descriptions and evaluation tools by discipline (including resident physicians), to see how interdisciplinary behavior can be reinforced on an ongoing basis. The group is identifying “high performing” inpatient teams to be tracked with high

Table 3: Medicine and Nursing Competencies

<u>Medicine</u>	<u>Nursing</u>
Patient Care	Relationship Centered Care
Medical Knowledge	Safe, Effective, Efficient care
Practice-based learning & improvement	Self-directed learning
Interpersonal & communication skills	Communication skills
Professionalism	Professionalism & shared values Reflection, self-analysis, self-care
Systems-based practice	Collaborative Health Care Health Care System Competence

quality outcomes (low length of stay, high patient satisfaction, low clinical mortalities, etc), that have high team satisfaction. The intent is to identify the characteristics of these teams in order to influence the redesign of care processes.

Our initial conclusions would include that there is a need and an ability to define “systems professionalism” and “systems competencies.” A common professional “value set” needs definitional work and we propose a start with our draft of interdisciplinary professional values. While there are important commonalities between the discipline competencies and the IOM aims, and both focus on “what is best for the patient,” there is a language gap on how to get there. A “word search” showed surprisingly little overlap between the language of the IOM aims and the competencies. Each profession (nursing, medicine, dentistry, pharmacy, social work) has

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articulated its own set of competencies, and although similar values are expressed, they are expressed in different languages. “Interdisciplinary” is a common concept but it is largely undefined at an individual disciplinary operating level, meaning true interdisciplinary training and practice is not clearly understood. Developing a glossary of terms that specifically embrace the IOM aims to be used for each discipline would aid in creating a common language and a “culture of quality.” Specific work defining patient-centered with the “patient as the center of control” is required, as recommended by the IOM. There is a clear need to insert definitions of patient safety and timely care into the competencies. There is also a need to define an operational definition of equitable care given the fundamental lack of equitability in resources available to individual patients. With a common language established across disciplines, better role definition and communication across disciplines should occur with improved patient clinical outcomes as a result. Finally, we recommend that these definitions be tested at the bedside, and that working groups within institutions be used to help define the practical steps for implementing revised competencies for true interdisciplinary care.

At OHSU, some clinical services are reorganizing themselves as functioning interdisciplinary teams. There are numerous “drivers” including desire to improve patient-centered care and clinical outcomes, teaching, morale, and to meet RRC requirements for an 80-hour work week. To date these efforts have been most successful in procedure-based or

specialty-based clinical areas. These efforts are an opportunity to learn the desired behaviors and predictors for the adoption, implementation, and maintenance of successful interdisciplinary care in an acute inpatient setting. ■

- ¹ Institute of Medicine. 1999. *To Err is Human*. Washington D.C.: National Academy Press.
- ² Institute of Medicine. 2001. *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, D.C.: National Academy Press.
- ³ Institute of Medicine. 2001. *Envisioning the National Health Care Quality Report*. Washington D.C.: National Academy Press.
- ⁴ Institute of Medicine. 2003. *Health Professions Education: A Bridge to Quality*. Washington, D.C.: National Academy Press.
- ⁵ Institute of Medicine. 2004. *Patient Safety: achieving a New Standard for Care*. Washington, D.C.: National Academy Press.
- ⁶ Blue Ridge Academic Health Group: Report 7. *Reforming Medical Education: Urgent Priority for the Academic Health Center in the New Century*. 2003. Members: DE Detmer and MME Johns, Co-Chairs; D Blumenthal, EC Bond, RW Cantrell, HT Debas, MA Geheb, PO Kohler, S.Lipstein; GF Sheldon. Invited Participants: C DeAngelis, J Koplan, L Lewin, A Rubenstein, M Whitcomb, L Wilkerson.
- ⁷ ABIM Foundation, ACP-ASIM Foundation, and European Federation of Internal Medicine. *Medical Professionalism in the New Millennium: A Physician Charter*. *Annals of Internal Medicine* 136(3): 243-246.
- ⁸ Brennan TA. Physicians’ Professional Responsibility to Improve the Quality of Care. *Academic Medicine* 77(10):973-980.
- ⁹ Duffy FD, Zipes, DP. The Future of Certification and Recertification. *American Journal of Medicine*. 117:140-144, 2004.
- ¹⁰ Cohen JJ. Closing the Gaps by Working Together. Presidential Address, AAMC Annual Meeting, October 24, 1999, Washington, D. C.
- ¹¹ Cohen JJ. Our Quest for Meaning. Presidential Address, AAMC Annual Meeting, November 9, 2003, Washington, D.C.
- ¹² Dickey, J, DE Girard, MA Geheb, CK Cassel. Using Systems-based Practice to Integrate Education and Clinical Services. Medical Teacher, University of Dundee (in press, 2004).
- ¹³ Northwest Health Foundation, 2001. *Oregon’s Nursing Shortage-A public Crisis in the Making*. Portland, Or.
- ¹⁴ The Accreditation Council for Graduate Medical Education. (2001) ACGME Outcome Project [Internet] Chicago, IL. Available from: <http://www.acgme.org/outcome/project/proHome.asp>
- ¹⁵ Oregon Consortium for Nursing Education: Nursing Competency Statement 4.0 Portland, Oregon 2004. Based on previous work on societal definition of nursing and core competencies. Oregon Nursing Leadership Council, 2002
- ¹⁶ Accreditation Standards for Dental Education Programs. Commission on Dental Accreditation. American Dental Association, Chicago, IL
- ¹⁷ American Society of Health System Pharmacists. Accreditation Standards: Practice Residencies. Bethesda, Maryland, 2001.
- ¹⁸ National Association of Social Workers Scope of Practice and Code of Ethics <http://www.socialworkers.org/pdev/default.asp> <http://www.socialworkers.org/pubs/code/code.asp>

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Reducing Errors in Teaching Hospitals: Modest Progress and Future Challenges

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Over four years have passed since the publication of the Institute of Medicine Report, *To Err is Human*.¹ Since that time, teaching hospitals and the graduate medical education community have begun to respond to the call for increased patient safety through resident work hour restrictions, better integration of information technology, and the modification of teaching programs. Nonetheless, tremendous progress is necessary if teaching hospitals are going to successfully train what Carolyn Clancy has dubbed, “the IOM generation.”² In the following essay, we discuss early progress and challenges faced by teaching hospitals in a few important areas ranging from organizational culture to error reporting in designing systems to minimize errors. In a previous publication, we provided more extensive suggestions for teaching hospitals to address patient safety and resident education.³

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Early progress and challenges

On some level, most teaching hospitals have embraced the public outcry to address patient safety. It appears that many hospitals have invested in information technology, introduced new teaching programs to address errors and safety, and responded swiftly to the new duty hour requirements put forth by ACGME. The literature is rich with discussion of patient safety in academic hospitals, and in February 2003 the Association of American Medical Colleges (AAMC) published a monograph *Patient Safety and Graduate Medical Education*.⁴ The monograph proposes a holistic approach to patient safety that encompasses education and training program reforms, error and root-cause analysis, administrative leadership, error disclosure, emotional support, and allocation of the necessary resources to enable teaching hospitals to succeed in reforming the education system and clinical environment to significantly reduce errors. There has been much dialogue about issues like root cause analysis and anonymous error reporting systems that show promise as vehicles to reduce error rates.

However, despite some progress, reports still abound that hospitals have been slow to adopt systems such as computer

order entry, which has been shown to reduce medication errors by as much as 55%⁵. Poon et al. recently reported that a survey of both teaching and non-teaching hospitals revealed only a 10-15% rate of adoption of computerized order entry. Reasons given included cost, physician resistance and product immaturity. Information technology holds great promise to

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improve safety and has been fully implemented in some hospitals. An example of a state of the art system is that at Brigham and Women’s Hospital in Boston, which includes computerized order entry, electronic medical records and automated sign-out information to facilitate transfer of information between providers. VA hospitals also have been long-time leaders in implementing a fully-functional electronic medical record system that includes all data on care provided nationwide, as well as other features to promote safety such as cross checking allergies, renal function and drug dosing, current medication lists, and all clinical encounter notes and test results.

Culture

James Reason, an expert on “human error,” reminds us that in highly complex environments such as hospitals, systems must be designed with two principles in mind: (1) humans are fallible; and (2) systems contain latent errors that under certain circumstances can set up individuals to fail.⁶ Latent errors are errors that reflect underlying flaws in system design that make errors more likely to happen. This philosophy runs counter to the long-standing culture of personal accountability in medicine and residency education. Historically within medicine, errors have been blamed on the failing of individuals and the underlying systematic factors such as extreme fatigue, poor handwriting or lack of record availability have been discounted. It is the challenge of teaching hospitals to create a

“Historically within medicine, errors have been blamed on the failing of individuals and the underlying systematic factors such as extreme fatigue, poor handwriting or lack of record availability have been discounted.”

work environment for residents that continues to promote professionalism and accountability but removes the blanket of blame and shame that often clouds the approach to address medical errors. Focusing on the failings of individuals precludes design of reporting systems that would allow for effective analysis of systematic patterns of errors and thereby approaches for successful prevention. Thomas Gallagher at the University of Washington has explored the issues of error disclosure and emotional support for doctors who err.⁷ Through his research, the institution has begun to implement programs that could have a long-term impact on the culture surrounding medical errors.

While some departments within teaching hospitals have attempted to change culture, the effort fails to achieve intended results if the culture within the institution as a whole does not change. For example, single departments may create effective reporting, disclosure and educational programs but with patient care provided by multiple services and departments within a hospital, finger pointing and blaming individuals can often supplant systematic analysis of underlying causes when errors or near misses occur. Administrative leadership at the highest levels that crosses departments is fundamental to culture change within an institution.

Resident duty hour reform

Implementation of the new ACGME duty hour requirements occurred relatively swiftly in 2003. Most hospitals were quick to respond, particularly in the face of high-level publicity in the media surrounding the probationary action against Johns Hopkins University.⁸ However, compliance with duty hour regulations has yet to be reported in the literature or by ACGME and advocates for federal regulation continue to report stories of duty hours in excess of the new rules. Work

“The work hour restrictions provided a tremendous opportunity for hospitals to reassess their entire teaching programs, team structure, call system, and roles of ancillary staff.”

hour restrictions combat the detrimental effects of both acute and chronic sleep deprivation through limits on continuous duty and weekly cumulative hour limits. There are good conceptual reasons on this basis to believe that error rates might decrease, particularly in specialties in which weekly hours previously approached 120 hours or more.

The work hour restrictions provided a tremendous opportunity for hospitals to reassess their entire teaching programs, team structure, call system, and roles of ancillary staff. These reforms were in many cases long overdue, but provide hospitals with new challenges regarding continuity of

care between providers and the integration of education into experiences such as “night float” rotations. Program directors must work closely with residents to ensure that transfer of care occurs in a standardized manner with an optimal level of information transfer to prevent errors from poor communication when the original team providing care goes off-duty.

Procedures, simulations and safety

Residents must be afforded increasing responsibility for patient care as they advance in their training in order to achieve competence prior to independent practice. At some point, residents must perform a procedure for the first time. The education system currently functions under a “see one, do one, teach one” philosophy. However, it is unlikely that in most cases this provides an appropriate balance of education and safety. Technology today has allowed the development of complex simulation hardware and software that could be more widely used for the initial training of residents and medical students. Anesthesia training programs have been at the forefront of adopting simulator-based training and have also developed procedure protocols to improve safety.⁹ The Hospital of the University of Pennsylvania recently implemented training programs for medicine residents for several bedside procedures through collaboration with the Department of Surgery and several medical subspecialties.

Beyond simulations, hospitals must find ways to provide appropriate training, supervision and certification of competence. Senior residents, who may not be truly proficient in a procedure, generally serve as the supervisor in training interns and students in procedures. Might there not be a better approach to ensuring that procedures are properly taught to novice physicians and students? Proper supervision and certification are key elements of complex or high-risk procedures in safe work environments and are common managerial tools used in other industries. Medicine must find ways to standardize training and to certify competence and consider the need for recertification at later stages of training.

Team leadership

The complex nature of health care delivery results in an increasing number of providers involved in each patient’s care. Moreover, in educational environments students, interns, residents and attending physicians are all involved in the provision of care from the same clinical specialty. In other complex team-oriented industries, communication systems are studied and refined to ensure the highest level of safety. Medicine lags far behind in formalizing systems of communication and training team leaders on the coordination of care. Academic hospitals must begin to formally train residents on team leadership and the effective delegation of tasks and coordination of intra- and inter-team communication.

Error-reporting

Efforts to improve safety and quality hinge on the ability of hospitals and health systems to collect and systematically analyze data on errors and near misses. Without proper data collection and analysis, latent errors built into systems will never be uncovered and providers will remain on the frontline vulnerable to committing errors. Reporting systems often

“Reporting systems often suffer from low utilization when providers are subject to blame and there is not an opportunity for anonymity. The University of Pennsylvania has responded to a state-mandate for error reporting by creating a web-based anonymous reporting system.”

suffer from low utilization when providers are subject to blame and there is not an opportunity for anonymity. The University of Pennsylvania has responded to a state-mandate for error reporting by creating a web-based anonymous reporting system. This permits investigation of each incident or near miss as well as the identification of institutional patterns that are likely to uncover latent errors. However, systems such as this can only be effective if administrators and other institutional leaders are able to shift culture in a manner that makes error disclosure “safe” for residents and other providers.

Conclusions

Teaching hospitals are in a unique position to lead national safety and quality initiatives and to train the next generation of physicians with a new eye toward error reduction and safety. Residents are uniquely positioned in teaching hospitals to understand the highly complex conditions that can lead to medical errors and near misses and, as the primary providers of care, must be involved in error reduction efforts. Error reduction efforts should be part of training in good clinical practices and hospital-wide quality improvement efforts. However, the sluggish rate of cultural change in hospitals continues to serve as a major barrier to maximizing safety. Leadership is required at the highest levels of hospital administration and among department heads to ensure that a more cooperative environment can emerge between departments and more open discussion of errors can occur free of the cloud of blame and shame. Anything short of this will greatly hamper efforts to respond to the public outcry for increased patient safety and fail to adequately train the “IOM generation” to be effective participants in a safer health care system. ■

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Patient Safety and GME Curricula: Function Follows Form

John Russell, MD

The Institute of Medicine's report, "To Err Is Human", released in 1999, increased public awareness of medical errors and adverse patient outcomes in a way that was unprecedented and, unquestionably, beneficial.¹ This raises the question why some segments of the medical profession responded with surprise, dismay and even denial of this report's findings?

Although the literature on medical error and adverse patient outcomes has grown exponentially in the past decade, interest in patient safety is not new. Important contributions date from the 1950's, if not earlier.¹ However, until recently, our appreciation of the complex interaction of fallible human performance with "latent" system errors that can lead to medical errors has been incomplete.² Our personal experiences as clinicians and patients surely tells us that medical error and adverse patient outcomes are an unfortunate, but sometimes seemingly inevitable, consequence of medical care. If we believe that educational experience helps form our current professional attitudes, a review of the ACGME's Program and Institutional Requirements regarding medical error and patient safety may offer useful insight into this paradox. A time-honored tool, the Morbidity and Mortality (M&M) conference, may provide a useful solution.

ACGME and RRC requirements

Incorporation of the General Competencies into the Program and Institutional Requirements has had a profound impact on the educational curricula and evaluation methodologies of residency programs. Patient safety and its corollaries, adverse

"Patient safety and its corollaries, adverse outcomes and medical errors, are multi-competency issues. Surprisingly, they are not mentioned in the current ACGME Institutional Requirements."

outcomes and medical errors, are multi-competency issues.³ Surprisingly, these issues are, at best, only indirectly mentioned in the current ACGME Institutional Requirements.⁴ Under Section II D (Quality Assurance) it is required that "sponsoring institutions must ensure that formal quality assurance programs are conducted, and that there is a review of complications and deaths."⁴ A review of the 118 program

requirements promulgated by 26 Residency Review Committees and the Transitional Year Review Committee, showed that only 45 (38%) require an M&M conference, an equivalent case-based review of adverse medical outcomes, or a clinical quality assurance or improvement conference as a component of the educational curriculum. The ACGME Common Program Requirements, which became effective in July 2003, mention patient safety only in the context of resident duty hours and the working environment.⁵ Moreover, among the disciplines that require M&M Conferences, there are important discipline-specific differences. For example, in Anesthesiology and Internal Medicine, M&M conferences have often been presentations of interesting cases, rather than the focused reviews of "bad clinical outcomes" that typify these conferences in Surgery.⁶⁻¹⁰

In a 1998 survey of Internal Medicine program directors, 90% reported they used an M&M conference (or an equivalent), although it was not explicitly required in the Internal Medicine Program Requirements.^{8,9} The requirements state "conferences correlating current pathological material, including material from autopsies, surgical specimens, and other pathologic material with the clinical course and management of patients must be held at least monthly."⁹ This best describes a clinical pathological conference (CPC) rather than an M&M conference.⁹ An observational study of M&M conferences in Internal Medicine and Surgery found that the Internal Medicine M&M conference more commonly resembled a CPC.¹⁰

The current Program Requirements for Internal Medicine (effective 7/1/2003) specifically require that programs conduct clinical quality improvement (M&M) conferences. They differentiate M&M conferences from grand rounds and CPCs. The requirements define the required conferences as focused "...on adverse clinical events on the teaching service...(that) should analyze the causes and consequences of each event, and should result in proposals for actions to avoid recurrence of similar events."¹¹ It would be informative to have current information on the use of M&M conferences in Internal Medicine, to learn whether the more explicit RRC requirements has resulted in conferences in Internal Medicine programs that more closely resemble those in Surgery.

The Surgery M&M Conference

Much has been written about the M&M Conference in Surgery, which has long been a mainstay of surgical education. Charles Bosk rightfully identifies these conferences as an integral part of the acculturation of residents into the society of surgeons, in many ways akin to such cultural traditions as the "smoke house ritual" for some Native American tribes, and Reconciliation for Roman Catholics.⁷

The traditional surgical emphasis on the performance of the individual surgeon, and the resulting primacy of surgeon accountability for patient outcomes, both good and bad, deserves reconsideration in light of the present-day conceptualization of human error as the result of the complex

interaction among human performance, technology and systems-level processes.² Surgeons would do well to review the seminal work of Ernest Avery Codman, MD, the iconoclastic Boston orthopedic surgeon. Nearly 100 years ago he advanced the concept of public accountability for adverse patient outcomes as a critical component of his “End Result System”.^{12,13} Codman’s classification of the causes for clinical

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outcomes that “lack perfection” included surgeon, system, patient and disease-specific factors.¹²

Inculcation of a sense of personal responsibility for adverse patient outcomes may be critical to effective clinical education, as it may be fundamentally tied to the capacity for personal growth as a consequence of error.^{13,14} Studies have shown that residents who tended to ascribe adverse patient events to system deficiencies were less likely to modify their subsequent clinical behavior.¹⁴ This highlights a delicate balance between system-level and personal accountability for adverse events that needs to be emphasized in our residency education programs.¹³

Advocates of the Surgery M&M Conference as an educational entree for the discussion of adverse patient events, medical errors, and patient safety, need to acknowledge that there are potential pitfalls in this format. For example, in trying to simultaneously achieve goals for education, quality improvement and peer review, Surgery M&M Conferences can lose focus and educational impact.¹⁵ In addition, the format causes individuals to perceive a risk of loss of professional stature among colleagues, due to bad outcomes discussed in these conferences. This has been recognized as a deterrent to willing participation by all physicians.^{13,16} At the same time, grounding the Surgery M&M Conferences in recent clinical cases creates an educational “immediacy” and validity that is ideal for adult learners. Characteristics of the “ideal” M&M conference that have been described in the literature include:

1. Well-prepared, focused case presentations that allow sufficient time for discussion;
2. Primary focus on education by and for all participants;
3. An atmosphere of open, honest, thoughtful and collegial criticism;
4. Identification, but not personalization, of errors;

5. Balanced discussion of evidence-based “best practice” with the case-based clinical experience of acknowledged experts;
6. Reinforcement of our professional responsibility for high quality, safe clinical care;
7. Acknowledgement by all participants, *especially* the moderator, that we all make errors; and
8. “What did we learn from this case; what will we do differently in the future?”^{8,13,17-20}

Recent innovations for the M&M Conference have included linking case discussions to a hospital-specific database of clinical outcomes, and use of the M&M Conference as the “organizing principle” for an entire residency education curriculum.^{21,22}

A modest proposal

However imperfect it may be in its execution, the M&M Conference has served as the starting point for the formal and informal education curriculum on adverse patient outcomes, medical error and patient safety in many disciplines. These conferences exist because of tradition, perceived educational value and, undoubtedly, because of discipline-specific RRC requirements. A new “function” of patient safety education can follow from the traditional “form” of the M&M Conference. The apparent gap in awareness of patient safety issues among some of our medical colleagues may, in part, be explained by the absence of such mandated conferences in some residency education programs.

If we expect physicians to engage in improvements to enhance patient safety, we need to ensure that patient safety and the analysis of medical errors and adverse patient outcomes are central components across the continuum of medical education. Lectures alone may be insufficient to facilitate the assimilation of the necessary knowledge, skills, and attitudes in this important domain of clinical practice. Enhancing the analysis of medical errors and adverse patient outcomes by incorporating M&M conferences into the Institutional and Common Program Requirements for all ACGME-accredited programs would be an important first step toward promoting patient safety goals in residency education programs. ■

“For example, in trying to simultaneously achieve goals for education, quality improvement and peer review, Surgery M&M Conferences can lose focus and educational impact. In addition, the format causes individuals to perceive a risk of loss of professional stature among colleagues, due to bad outcomes discussed in these conferences have.”

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VA Patient Safety Curriculum for Residents: An Update

John Gosbee, MD, MS, Linda Williams, RN, MSI, and Edward Dunn, MD, MPH

.....An anesthesiology resident (recently) thanked me for arranging the sessions because they “really changed the way I think.” The resident went on to describe being more aware of the environment in which we work. Also, this resident now recognizes and evaluates the potential impact of systems on patient care. Similarly when faculty raises systems issues now, they frequently refer to “that guy who talked about systems and safety.” They are recognizing patient safety issues in their daily work environment... - *Excerpt from an e-mail message from a program director after resident and faculty teaching sessions on human factors engineering and patient safety.*

Nearly one-half of the nation's approximately 100,000 residents receive some training in a VA facility, and the Department of Veterans Affairs (VA) National Center for Patient Safety (NCPS) and its academic partners have been developing, testing, and implementing a patient safety curriculum for residents, medical students and other health professionals. Since the first article about this effort appeared in the Fall 2002 *ACGME Bulletin*,¹ the curriculum has evolved and new directions have been explored. The tool kit has expanded to include new modules and formats, the tools have undergone extensive testing, and there is heightened emphasis on faculty preparation. At the center of this activity are the physician teachers and patient safety managers within the VA and affiliated universities. Their pioneering work continues to effectively change the mindset of residents and faculty to move us toward creating a “culture of safety.”

The National Center for Patient Safety (NCPS)

NCPS provides tools, policies, and implementation support for patient safety activities within the more than 160 VA federal healthcare facilities. Since its inception in 1999, NCPS has

“It is hoped that further development and increased use of patient safety curriculum will contribute to increased participation in these patient safety activities by residents.”

worked with patient safety and quality improvement staff at each VA facility to promote a culture of safety. A major goal is to implement tools for Root Cause Analysis (RCA) and Healthcare Failure Mode and Effect Analysis (HFMEA).^{4,5} It is hoped that further development and increased use of patient safety curriculum will contribute to increased participation in these patient safety activities by residents.

The curriculum consists of five modules: 1) Patient Safety Overview; 2) Human Factors Engineering and Patient Safety; 3) Patient Safety Interventions; 4) Usability Testing Exercise; and 5) a Root Cause Analysis Exercise. Physicians and patient safety staff from VA hospitals and affiliated universities volunteered their assistance to develop a foundation of experience with the five modules. **Exhibit 1** shows a timeline of the VA patient safety curriculum project.

Exhibit 1:
Timeline of the VA Patient Safety Curriculum Project

1994-1999	John Gosbee, MD ^{2,3} developed and taught patient safety and human factors engineering modules for Michigan State University residents and students
July 2002	Physicians and patient safety managers at VAs and affiliated universities volunteered to learn about and teach patient safety modules
April 2003	Symposium for volunteer teachers and other stakeholder representatives to discuss lessons learned, assessment data, new modules, and next steps
May-Dec. 2003	NCPS pilot tested faculty development approaches; and volunteers and NCPS tested and refined new modules and new formats
Jan. 2004	Teleconferences and a meeting to develop curriculum workshop
March 2004	First curriculum workshop with 40 attendees from VAs and universities

Goals and objectives

Goals and objectives for the VA Patient Safety Curriculum arise from a well-documented need for health care workers to become part of a culture change toward patient safety, including residents as key participants in patient safety activities (e.g., members of RCA teams). Other goals emerge from the ACGME general competencies, particularly Systems-Based Practice. Finally, human factors engineering is an integral part of teaching patient safety to individuals who are not familiar with a systems thinking approach.^{6,7}

Goals

1. Residents are active agents of change toward systems and quality approach; away from “blame and train” model;
2. Residents incorporate understanding of human performance and high reliability organizations into patient care and patient safety activities;
3. VA facilities help affiliated residency programs provide great education (as outlined in ACGME core competencies).

Objectives

1. Understand the scope and gravity of patient safety events (adverse events);
2. Know theoretical and practical reasons why “blame and train” approaches fail;
3. Become familiar with the basics of safety and human factors engineering;
4. Understand importance of discovering root cause toward developing proper interventions;
5. Become familiar with human factors engineering techniques related to root causes and how this is crucial to the design of effective interventions;
6. Understand major categories of patient safety interventions, as well as the limitations and pitfalls of automation as a countermeasure.

continued on page 17

Patient Care

CALL FOR ABSTRACTS

2004 ACGME ANNUAL EDUCATIONAL CONFERENCE

March 3-5, 2005

The Marvin R. Dunn Poster Session



A C G M E

“Initiatives in GME: Transforming the Learning Culture”

The Accreditation Council for Graduate Medical Education (ACGME) invites proposals for poster presentations and short communications at its annual conference on March 3-5, 2005 at the Gaylord Palms Resort and Convention Center in Kissimmee, Florida. Program directors, faculty, administrators and residents interested or involved in graduate medical education (GME) are encouraged to submit proposals.

SUGGESTED TOPICS FOR SUBMISSION

The ACGME has a special interest in soliciting abstracts that focus on approaches to teaching and/or assessing any of the six general competencies and efforts toward faculty development focusing around the competencies. This year's poster selections will be limited to 1) innovative approaches, completed or in-progress, that focus on teaching and assessing the six general competencies and 2) creative approaches that address the issue of resident duty hours and demonstrate their impact on education and patient/resident safety at the program or institutional level. Several abstracts from Category One (see above) will be selected for oral presentation at the competency workshops on Saturday morning, March 5, 2005. Those selected will be notified in advance of the workshop.

SUBMISSION PROCESS

To be considered for a presentation, your abstract submission must be received electronically by **January 7, 2005**. All submissions will be reviewed and evaluated by the judging panel for relevance, content and clarity. Notification of acceptance for presentation will be e-mailed by **January 14, 2005**. Individuals selected for the oral short communications will present on Saturday morning, March 5, 2005. Poster presenters will be required to prepare a poster for the session and be available from 5:00 pm - 7:00 pm on the evening of Friday, March 4, 2005 to discuss the poster. Accepted abstract submissions will be printed for distribution to program participants as a part of the workshop agenda. **ALL PRESENTERS ARE REQUIRED TO REGISTER FOR THE WORKSHOP.**

Professionalism

Interpersonal and Communication

Systems-Based Practice

Resident Duty Hours

FORMATTING INSTRUCTIONS

Abstracts must be submitted as a single-page document typed in Microsoft Word or Word Perfect. Margins should be 1-inch on all sides. DO NOT use abbreviations in the abstract title. The abstract title should be typed in ALL CAPS. The title should be brief, but clearly indicate the nature of the project or investigation.

The author(s) name(s) and institutional affiliation(s) should be typed in Title Case (upper and lower letters) on the line after the title. The abstract must be sent to abstracts@acgme.org as an e-mail attachment. The sender of the abstract should be the lead author. All communication will occur with the lead author. Questions regarding the abstracts should also be sent to this electronic address.

NOTE: Simple graphs or tables may be included if they fit on the single page. The text of the abstract must be organized into the sections below (use headings in bold):

1. **Purpose** of investigation or project
2. **Methodology**, including investigation or project design and analysis
3. **Summary of results** (if applicable)
4. **Conclusions**

Abstract Checklist:

1. The abstract must be typed in 10-pt or 12-pt Arial or Times Roman font style; margins must be 1-inch on all sides.
2. The title should be typed in ALL CAPS.
3. Content of abstract should be single-spaced with double-space only between title and author's names.
4. The abstract must not exceed 300 words and must fit on a single page. Not more than three references may be included. If references are used, they must still fit on the single page.

SUBMISSION DEADLINE AND NOTIFICATION

All submissions must be received at the ACGME office no later than **January 7, 2005**. Submissions must be sent electronically according to the format outlined above. No substitutions will be accepted. Authors will receive confirmation of their submission upon its receipt in the ACGME office. The first author will be notified by **January 14, 2005** whether the submission has been accepted for poster or oral presentation. Display specifications and communication guidelines will be provided at the time of acceptance.

Abstracts submitted to other national meetings are acceptable provided they have not been accepted for publication in a peer-reviewed journal prior to the meeting date. Please note that the ACGME does not endorse any commercial medical education products, and therefore will not accept abstracts promoting the use of these products.

Exhibit 2 Agenda for the July 2004 Workshop

DAY ONE	DAY TWO
Background and Rationale for Being Here	Overview of Teaching Frameworks
Introduction to Patient Safety	Demo of web site, CD-ROMs, and videos
Human Factors Engineering	Modulettes during work rounds
Root Cause Analysis (RCA)	Doc-U-Dramas
Intro to Failure Mode and Effect Analysis (FMEA)	Patient Safety Case Conferences – Modified M&Ms
Patient Safety Interventions	"Selling" Patient Safety Curriculum
Swift and Long Term Trust	Assessment Approaches and Tools
"Reception" and Hands-On Demonstrations	"Capstone" small group break out sessions

April 2003 symposium

A symposium was held at NCPS offices in April 2003 to evaluate the modules based on nine months of tests at several VA and university sites. Surveys and open-ended questions compared the modules across different audiences – residents, medical students, nursing students and other learners. This revealed successes and problems in the presentations, handouts, exercises and teaching tools, and resulted in changes to several modules.

2004 curriculum workshops

A curriculum workshop held in March 2004 also sought feedback on the curriculum. Attendees recommended that NCPS encourage pre-work to make participants more familiar with routine patient safety activities; increase the length of the workshop to two full days with more small group exercises, practice of patient safety techniques, and sessions on how to implement a customized plan. They also suggested that tools for case conference and RCA exercise needed refinement, and that failure mode and effect analysis should be taught in addition to, or in lieu of, RCA. This produced a revised agenda for future workshops, shown in **Exhibit 2**. Another workshop was held in July 2004, and four more are planned for late 2004 and early 2005 in several locations throughout the United States.

Detail on selected modules and workshop sessions

The *Patient Safety Overview Module* includes working definitions of patient safety and discussion of the scope of the patient safety problem. It also introduces the concepts "culture of safety" and "high reliability organizations," and "close calls" (near misses). The *Human Factors Engineering (HFE) and Patient Safety Module* present definitions and conceptual models, with short case studies to highlight the main points. Group demonstrations and "games" are used to tie the concepts to actual patient safety incidents. The *Patient Safety Interventions Module* demonstrates how development of good root causes is crucial to developing and implementing effective interventions.

Learners are provided an overview of intervention types (e.g., labeling, policy, training, interlocks) and their relative efficacy; and unintended consequences of some "obvious" remedies are highlighted. The *Usability Testing Exercise* involves using everyday objects as analogies to medical devices (e.g., baby wipes in travel packs, mint dispensers). Groups of learners evaluate these devices around a common table or work surface, with one learner assigned to use the object, and the team identifying usage issues and making recommendations for redesign. The *Root Cause Analysis (RCA) Exercise* uses role play to illustrate the concepts of RCA around a clinical case. The RCA exercise will be captured in a training video to standardize this aspect of the curriculum. For teaching sessions, viewing the video will be followed by participants simulating an RCA using a case presented to them. RCA tools (CD-ROM, triggering questions, rules of causation) will be available as cognitive aids for this exercise.

"The presence of trust in a patient safety curriculum is critical because an important message of the curriculum may be difficult to accept for residents and students – that clinical mentors and role models are fallible, and that the health care processes that provide the context and environment for their learning are flawed."

Swift Trust and Long-Term Trust Instructors Training explores the concept, dimensions and sources of trust. The presence of trust in a patient safety curriculum is critical because an important message of the curriculum may be difficult to accept for residents and students – that clinical mentors and role models are fallible, and that the health care processes that provide the context and environment for their learning are

flawed. Strategies for establishing swift trust, or “making it safe,” for students and residents are discussed. Long term trust is presented in the contexts of “just culture,” and confidentiality protection for reported patient safety information in state peer review statutes and federal laws.

The *Patient Safety Case Conference (modified M&M) Module* encompasses tools, formats, and strategies to introduce and sustain systems-thinking by residents and attending faculty. Tools include booklets and cards to provide structure and a “cognitive aid” to help discussion keep on track and avoid “blame and shame” thinking. A discussion of a typical case conference is followed by a modified case conference through role-play wherein questions and comments take the case conference toward systems issues.

The *Case Studies During Working Rounds Modulette* seeks to make the most of potential patient safety issues that arise during work rounds. The modulette begins with observations by residents. As these are discussed, a topic may emerge and is developed into a ready-to-use modulette, with the goal of honing residents’ ability to recognize and identify potential

“Just as an insect zoo can demonstrate design for life on earth without need for an elephant house, a collection of tubes, valves, electrical connectors, control knobs, and display panels can hone the skills of observation and critical thinking about human factors design.”

hazards. It allows application of patient safety principles when a resident’s experience with a patient makes safety suddenly relevant. Current topics include hazards related to oxygen-air wall outlet confusion, MRI hazards.

The *Homework/Small Projects (e.g., Outcomes Card) Module* has the goal of promoting active learning through assignments prior or after structured teaching sessions. It includes facilitated participation on an RCA or HFMEA team or other patient safety project to illuminate safety and human factors engineering principles in a practical way. A related example is the Outcomes Card (OC) developed by Anne Tomolo, MD, MPH and others at the Louis Stokes VAMC/Case Western Reserve University School of Medicine. The OC assists residents in understanding system-based practice, and in identifying systems failures in the context of patient care.⁹ A model *Patient Safety Journal Club* conforms to the long tradition of journal clubs in residency programs. Possible source materials are cases on the AHRQ-UCSF Web M&M website (www.webmm.ahrq.gov), where experts from around the

country analyze five patient safety cases from different specialties every month. Others include the Emergency Care Research Institute (ECRI) web site (www.ecri.org), the Food and Drug Administration (FDA) web site (<http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfMAUDE/search.CFM>) and, for adverse events related to medications, the Institute For Safe Medication Practices (ISMP) (www.ismp.org).

Finally, the *Hands-on Museum* is a novel and valuable teaching aid. If a picture is worth a thousand words, an object conveying the same message – one that can be handled, examined, and tested – is worth even more. Refining the observational skills of medical practitioners by making well-designed objects, and problem designs, available for handling generalizes to all devices and equipment. If an ambu-bag that looks like it should function well fails to recover its shape sufficiently to deliver a succession of breaths that meets a minimum standard, how much greater the risk in a complex device such as a perfusion machine? A hands-on collection need not be extensive or require special storage space. Just as an insect zoo can demonstrate design for life on earth without need for an elephant house, a collection of tubes, valves, electrical connectors, control knobs, and display panels can hone the skills of observation and critical thinking about human factors design.

Lessons learned

To date, few understand the complexities of teaching a comprehensive patient safety curriculum. The comfort zone for most volunteer teachers still lies within Patient Safety Overview, RCA Exercise, and Modified Case Conference modules. At the same time, it is surprising how many adult learning tools and tips are scattered throughout the modules. Evaluations after completing curriculum modules are generally positive, the evaluations from medical students were less positive than those from residents or nursing students, and the introductory module received lower scores than the others. Modified case conferences or Morbidity and Mortality conferences were often judged to be easier to implement and predicted to be effective in changing mindset. The qualitative findings did not bear this out.

The VA patient safety curriculum differs in some aspects from other quality and safety curricula.¹⁰ Some of these do not explicitly discuss a “basic science” framework for patient safety or focus on systems of care. In contrast, our curriculum stresses that, as microbiology is important to infection control, human factors engineering is vital to quality and safety. In

many other safety courses there is little mention of adverse events related to “at-risk” behavior, and unrealistic proposals that the organization should adopt a “blame-free” posture. One of the largest contrasts is the use of the word “error”. Although a supposed simple word used in everyday conversation, “error” is not easily defined, and may not be a useful concept

“One of the most challenging aspects has been getting adequate resident participation in the safety curriculum and in the day-to-day efforts to promote patient safety.”

for patient safety.¹¹ It is common to see learners and teachers alike inadvertently try to find “errors”, and stop immediately once they have been found.

One of the most challenging aspects has been getting adequate resident participation in the safety curriculum and in the day-to-day efforts to promote patient safety. NCPS believes it is crucial to have all categories of staff at VA facilities participate in the patient safety efforts including residents. Yet, a quantitative analysis of participation on VA RCAs in 2000-2002 showed that physicians represented 17% of RCA team membership, and residents a meager 0.1%! Through the continuation of curriculum development and workshops for faculty we expect to see more residents on RCA and HFMEA teams. Small group work and homework both seek ideas for overcoming barriers for participation on teams – and in other patient safety activities.

Conclusion

The VA’s patient safety curriculum continues to develop and improve, and to establish and prove its value. NCPS and its partners use the curriculum modules and apply principles of adult learning, which contributes to ongoing improvements in curriculum content and delivery. As residents and medical students are exposed to the curriculum and the accompanying change in mindset, we expect they will become effective agents for improving the systems in their hospitals and clinics. Putting the expanded patient safety curriculum toolkit in the hands of enthusiastic and more thoroughly prepared physician teachers and patient safety managers across the country will fuel the advancement toward creating a true culture of safety. ■

¹ Gosbee, JW. A patient safety curriculum for residents and students: The VA Healthcare Systems pilot project. ACGME Bulletin. November 2002. Pp. 2-6.

² Stahlhut RW, Gosbee JW. (1997). A human-centered approach to medical informatics for medical students, residents, and practicing clinicians. Acad Med. 1997;72(10):881-887.

³ Gosbee JW. Human Factors Engineering is the Basis for a Practical Error-in-Medicine Curriculum. Glasgow Accident Analysis Group Technical Report G99-1. Univ. of Glasgow. Online at <http://www.dcs.gla.ac.uk/~johnson/papers/HECS_99/Gosbee.htm>

⁴ Bagian JP, Gosbee JW, Lee CZ, Williams L, McKnight SD, Mannos DM. (2002). VA’s root cause analysis system in action. Jt Comm J Qual Improv. 2002;28(10):531-545.

⁵ Stalhandske E, DeRosier J, Patail B, Gosbee JW. How to make the most of failure mode and effect analysis. Biomed Instrum Technol. 2003;37(2): 96-102.

⁶ Sojourner RJ, Aretz AJ, Vance KM. Teaching an introductory course in human factors engineering: A successful learning experience. In Proceedings of the Human Factors and Ergonomics Society 37th Annual Meeting. Santa Monica, CA: Human Factors and Ergonomics Society, 1993. pp. 456-460.

⁷ Gosbee JW, Anderson T. Human factors engineering design demonstrations can enlighten your RCA team. Quality & Safety in Health Care. 2003; 12: 119-121.

⁸ Gosbee JW. Introduction to the human factors engineering series. Joint Commission Journal on Quality and Safety. 2004; 30(4): 215-219.

⁹ Tomolo, A Patient safety curricula: The urgent care outcomes card: A systems based practice tool. Presented at the ABMS-sponsored Planning meeting to develop a web-based patient safety education/improvement module. Coconut Grove, FL. March 11-12, 2004.

¹⁰ Cosby KS. Patient safety: a curriculum for teaching patient safety in emergency medicine. Acad Emerg Med. 2003; 10(1): 69-78

¹¹ Dekker S. The Field Guide to Human Error Investigations. Burlington, VT: Ashgate. 2002.

John Gosbee, MD, MS, Linda Williams, RN, MSI, and Edward Dunn, MD, MPH work on the development of patient safety curriculum at the National Center for Patient Safety, Department of Veterans Affairs, Ann Arbor, MI. (www.patientsafety.gov) Questions or requests for additional information may be directed to John Gosbee, MD, at John.Gosbee@med.va.gov or 734-930-5893.

RRC/IRC Column

Council approves revisions to the program requirements in Emergency Medicine, Neurology, Nuclear Radiology and Vascular and Interventional Radiology

At the June 2004 meeting, ACGME approved revisions to the Program Requirements for Emergency Medicine, the Program Requirements for Neurology, and to the subspecialty requirements for Nuclear Radiology and for Vascular and Interventional Radiology. The revised program requirements will become effective January 1, 2005.

ACGME set to accredit Sleep Medicine, combined Internal Medicine-Pediatrics programs

ACGME approved new Program Requirements for Sleep Medicine, effective June 29, 2004. The Council also approved a process for accrediting Sleep Medicine programs, which will function as subspecialty programs of programs in internal medicine, pediatrics, neurology, otolaryngology and psychiatry. Because the review of programs will involve multiple RRCs, ACGME endorsed the recommendation of the Committee for Review of Program Requirements to form an advisory committee to review Sleep Medicine programs and make recommendations to the RRCs. Plans call for maintaining the advisory committee for a period of three years, and having its actions reviewed by the Monitoring Committee.

ACGME also approved program requirements and a process to begin accrediting combined residency program in Internal Medicine-Pediatrics. The initiative had extensive input from the American Board of Internal Medicine and the American Board of Pediatrics. Internal Medicine-Pediatrics programs comprise the largest group of combined residency programs, currently numbering 108 programs educating 1,501 residents nationally. A number of other specialties also offer combined training, and Chip Rice, MD, ACGME Chair, expressed hope that the effort to establish the process for accrediting combined Internal Medicine-Pediatrics programs will serve as a model for other specialties.

Until now, ACGME accreditation has not been available for combined programs, although their curricula and policies and procedures for resident education and evaluation are expected to meet ACGME program requirements that apply to their accredited core programs. Interest in accreditation of combined programs had increased to address licensure and visa issues facing residents in combined training. The review of combined programs will begin July 2005. The program requirements for all ACGME accredited specialties can be found on the ACGME web site at <http://www.acgme.org>.

ACGME denies request from surgical RRC chairs to increase hours for surgical chief residents

At its June meeting the Council denied the request by the surgical RRC chairs to increase the duty hour limit for surgical chief residents (residents in the final accredited year of a core

surgical residency) to 88 hours per week. The proposal had been first considered at the February 2004 ACGME meeting, and had been referred to the ACGME Duty Hour Subcommittee for additional evaluation. Discussion of the proposal continued to focus on the complex and divergent views on the effect of the duty hour limits on surgical education, and the lack of data that demonstrates the current standards have hurt resident education. The discussions of the proposal emphasized that programs can use the existing duty hour exception policy to request an 88-hour limit for their chief resident year, with the endorsement of their sponsoring institution's graduate medical education committee and approval of the RRC. The Chair of the ACGME noted that the availability of this option, with appropriate educational rationale, should be publicized to surgical residency program directors and the leadership of sponsoring institutions.

Other News from the February ACGME Meeting

New "Courage to Lead" award to recognize the contributions of DIOs

The ACGME authorized the creation of a "Courage to Lead" award to recognize the contributions outstanding Designated Institutional Officials (DIOs) make to resident education. The first award will be given in February 2005.

Duty hour subcommittee completes second report

Dr. David Glass, Chair of the Duty Hours Subcommittee, presented the committee's second report, which featured summary data from the first year of the implementation of the common duty hour standards and outlined tasks to be completed during the remainder of the Subcommittee's authorized period, which ends in September 2004. Planned activities include completing a summary of comments on the effect of the standards across specialties, advising ACGME on possible data sources to gauge this effect, and making a recommendation on whether the standards would benefit from refinement at this time.

At the request of the ACGME Board of Directors, the Duty Hour Subcommittee also will formulate initial recommendations for a body to advise ACGME after September 2004. There is interest in emphasizing a broader focus, which considers duty hours within the larger context of residents' learning environment.

ACGME appoints Public Director, TYRC members

ACGME approved the appointment of Mr. Michael L. Klowden, President and CEO of Milken Institute, to fill the vacancy that will be created when the term of current public director Agnar Pytte, PhD expires on September 30, 2004. The Milken Institute is a think tank that advises on global and

regional economic issues. Mr. Klowden received his BA from the University of Chicago and his JD from Harvard Law School.

ACGME also approved the appointments of Ronald Jay Zagoria, MD and Philip D. Lumb, MB, BS to the Transitional Year Review Committee. Dr. Lumb's term will begin January 1, 2006, to enable him to complete his current term on the RRC for Anesthesiology. For the interim, ACGME approved a one-year extension to Dr. Lloyd B. Tepper's term on the TYRC.

ACGME-Related Meetings

ACGME and the American Board of Medical Specialties (ABMS) will host a conference on *Systems-Based Practice* in Rosemont, IL on September 23-24, 2004. This will be the third in a series of conferences that have as their topic one of the six general competencies. Prior years' conferences have explored *Communication Skills and Professionalism*. ACGME and ABMS, have committed to at least six years of sponsorship to ensure that all general competencies receive in-depth discussion that highlights their use in the education and evaluation of residents and practicing physicians, including examples of "best practices."

On December 11-12, 2004, ACGME, together with the Institute for Healthcare Improvement (IHI), will cosponsor the third in a series of invitational conferences for program directors that combines *Practice-Based Learning and Improvement* with another general competency. This year's focus will be on *Medical Knowledge*. The conference will be held in Orlando, Florida.

Call for Abstracts for the ACGME 2005 Annual Educational Conference, Kissimmee, Florida

ACGME invites proposals for poster presentations and short communications at its annual conference to be held March 3-5, 2005. Program directors, faculty, administrators and residents are encouraged to submit proposals. A "Call for Abstracts" form is inserted in this issue of the *ACGME Bulletin*.

The 2005 ACGME Annual Educational Conference will be held March 3-5, 2005 at the Gaylord Palms Resort and Convention Center in Kissimmee, Florida. Information regarding room reservations, conference registration and contents of the program will be available on the ACGME website (<http://www.acgme.org>) by early fall. ■

National and International News about Graduate Medical Education

ACGME report reveals high level of compliance with duty hour standards

One year after the Accreditation Council for Graduate Medical Education implemented common duty hour standards for residents, data indicate that most programs are in compliance. Many programs have revised their schedules or adjusted their staffing to comply with the duty hour standards.

"The ACGME is gratified by the response of the teaching hospitals in the United States as they met the challenge of implementing the duty hour reform for residents," states David Leach, MD, Executive Director of the ACGME. "Major redesign of the system of health care is needed, and we still have a long way to go before we get it right. However, much has been learned in the last year. Individual accountability has been enhanced by team accountability. We are building knowledge about good learning for good patient care."

"Major redesign of the system of health care is needed, and we still have a long way to go before we get it right."

The full report, "The ACGME's Approach to Limit Duty Hours 12 Months After Implementation," is available on the ACGME's Web site, at <http://www.acgme.org/DutyHours/dutyhoursummary2003-04.pdf>

European community projects the effect of its new work hours

An article in The Daily Telegraph has drawn attention to the fact that limits on duty hours for physicians in training in the United Kingdom may produce a future cohort of surgical specialists who could be less well-prepared for the independent practice of surgery than the current cohort of surgical "consultants." Nick Boyle, a consultant surgeon from Kent, UK, noted that prior to the implementation of work hour limits junior surgeons spent as many as 30,000 hours in training before becoming independently practicing consultants. Full implementation of the European Working Time Directive, which will reduce work time to 48 hours per week, and possible future changes under a proposed reform initiation ("Modernising Medical Careers") may reduce that number to as few as 6,000 to 8,000 hours.

The author predicts this will result in a need to revise the expectations for consultant practice to a far less independent model, in which future consultants will function under the direction of more senior surgical specialists.

AAMC submits comments on resident limit redistribution, other payment proposals

In July 2004, the AAMC submitted comments to the Centers for Medicare and Medicaid Services (CMS) proposals for Medicare graduate medical education (GME) policy contained in the May 2005 hospital inpatient annual proposed rule. In a letter, the AAMC asked CMS to clarify its policy on direct (DGME) and indirect (IME) payments for training in non-hospital sites where volunteer physician supervise the residents, and asked for clarification of payment policies for the subsequent residency period for residents who complete a "preliminary year" in internal medicine, pediatrics or surgery. The Association also commented on the proposed process for reducing Medicare caps at hospitals that are below their cap limits, and distributing these positions to other hospitals that meet certain criteria. The AAMC expressed concern about the criteria and the process for reallocation of these slots. The comment letter can be found at <http://www.aamc.org/advocacy/library/teachhosp/corres/2004/071204.pdf>

New Book by Parker Palmer

Parker Palmer, PhD, who has done seminal work on teaching formation, and for whom the ACGME Parker Palmer Reward that recognizes exemplary program directors is named, will release a new book in September 2004. The book, entitled "A Hidden Wholeness: The Journey Toward an Undivided Life (Jossey Bass)," seeks to bridge the inner and outer life, to allow inner truth to find expression in individuals' lives, despite the external pressures they may face. Parker Palmer calls this the desire to "create safe spaces for the soul to show up and make its claim on our lives." Previous books by Parker Palmer have included "The Courage to Teach," "Let Your Life Speak," and "To Know as We are Known." ■

Editor's Occasional Column: The Nurse Kept Calling

Ingrid Philibert

Colleagues who are experts in aviation safety have told me that a common pattern emerges from the data collected by the flight recorder in the period before a crash - loss of situational orientation, followed by the wrong decision, followed at some point by the crash. Aviation is said to be years ahead of medicine in tracking major incidents and the events leading up to them, and in trying to make sense of patterns that emerge. In medicine, study of errors to identify common causes and addressing, has commenced quite recently.¹ But absence of a formal approach to track incidents that harm or nearly harm patients does not imply absence of information on the patterns that precede them. A common

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thread that emerges from the informal review of accounts of these incidents is that there were warnings. These warnings did not come from a structure put in place to enhance patient safety, but arose naturally from a functioning system. An example is the statement, "the nurse kept calling..." Where the nurse's warning that something did not seem right was not heeded, adverse outcomes resulted with some frequency. That nurses can make complex clinical judgments has been supported by the literature.^{2,3} My intent is not to enter the debate on the diagnostic capabilities of nurses and other health care workers, but to highlight their role in achieving patient safety competence at the system-level. Errors are not unique to healthcare. Other industries have recognized that system-level problems require system-level solutions, and have instituted system-level changes to minimize errors and maximize recovery after an error has occurred. Aviation is the prominent example, as it draws on data collection to identify patterns of error, seeks to create system-level redundancy and tries to make the safe choice the easy choice. Aviation also has emphasized team vigilance, the responsibility of all members of the team to speak up if they become aware of a problem.

Recent gains and losses

Given medicine's reliance on individual attention and cognitive function, how can hospitals and teaching institutions in particular create system-level solutions to enhance patient safety? How has the implementation of common duty hour

limits affected institutions' efforts to create systems for safe care? There is sound evidence that the limits have resulted in residents who are more rested and alert for the provision of care and the learning process. But in many settings, these gains have come at a cost. One concerning observation is increased discontinuity in residents' educational exposure to patients.

"Duty periods abbreviated by "night float" and "short call" have reduced residents' ability to be present for the emergence of diagnostic information, and to see the progression of illness and the impact of treatment."

Duty periods abbreviated by "night float" and "short call" have reduced residents' ability to be present for the emergence of diagnostic information, and to see the progression of illness and the impact of treatment. Moving in-house call to home call has produced another disconnect. Residents, often very early in their education, now make decisions remotely, without seeing the patient, when a review of visible symptoms and being with the patient could benefit safety and resident learning. "Being there" is important. Much of nurses' power in noticing the events that precede adverse outcomes may not come from a particular cognitive skill but from the fact that they spend time with the patients.

Thoughts for the coming months

Some comments about the negative effect of the common duty hour standards have mentioned losses in "system-level capacity for patient safety," through withdrawing residents from patient care units or attenuating their exposure to patients. Suggestions

".....the duty hour standards can only be as "good" as their implementation at the local level."

have focused on revising the standards. However, the duty hour standards can only be as "good" as their implementation at the local level. The past year, and New York's more extensive experience with state regulation of resident hours, have shown that this response can range from excellent to inadequate. What a high-quality local response can achieve is shown by the examples of thoughtful re-engineering of education and patient care that have occurred in the past year. The past year also has shown that many efforts to reformulate patient care and education to function with fewer resident hours require intervention above the level of the individual program. In many places, resident hours need to be replaced by other practitioners. In programs where residents are being

withdrawn from patient care units without assistance from the department and sponsoring institution, program leadership has the unenviable choice of keeping residents on duty beyond the limits or leaving patients without a provider.

Patterns similar to those preceding air crashes can be found in medicine, emerging from the publicized stories of errors that have as their consequence death or irreversible harm for the patient. They are equally present in errors that do not receive public attention, and in those that are recovered before they result in adverse consequences. That some errors "slip through" highlights failures in the system and in system recovery, potentially because elements of the system do not exist, have been dismantled because of competing demands such as duty hour compliance, or do not yet recognize each as part of a system.

That enhancing patient safety is both a local- and a national-level phenomenon is highlighted in the articles in this issue of the ACGME Bulletin. Gosbee et al. focused on the local effects of the implementation of a national curriculum. The article emphasizes the importance of trust, in part to avoid

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placing residents interested in enhancing patient safety at risk for their careers or well-being. Local circumstances can be powerful opposing forces to well-intended efforts. This is as true for patient safety, as it is for the effort to reduce duty hours. Residents benefit from faculty and program leaders that understand and address these issues at the local level, even as they seek national solutions to reduce the stricture of duty hour limits or decrease medical malpractice awards. The benefit is the creation of a local environment in which learning and safe patient care co-exist in the present, while enhanced solutions are being discussed at the national level. ■

- ¹ Veasey S, Rosen R, Barzansky B, Rosen I, Owens J. Sleep Loss and Fatigue in Residency Training: A Reappraisal. *JAMA*. 2002;288:1116-24.
- ² Buckingham CD, Adams A. Classifying clinical decision-making: interpreting nursing intuition, heuristics and medical diagnosis. *J Adv Nurs*. 2000 Oct;32(4):990-8.
- ³ Hamers JP, Huijjer Abu-Saad H, Halfens RJ. Diagnostic process and decision making in nursing: a literature review. *J Prof Nurs*. 1994 May-Jun;10(3): 154-63.

The Florida Patient Safety Corporation 2004 – A Model for Other States

Paul Barach, MD, MPH

“The value of history lies in the fact that we learn by it from the mistakes of others, as opposed to learning from our own which is a slow process” - *W. Stanley Sykes (1894-1961)*

A request from the Florida Agency for Health Care Administration (AHCA), prompted by interest in enhancing patient safety, in October 2003, resulted in the state’s academic medical centers collaborating to create the Florida Patient Safety Network. Under contract to the state, this network produced a detailed plan to facilitate the development of a Patient Safety Authority (later named the Patient Safety Corporation) to advance the quality of care for patients in the state.¹ The report is one of several deliverables commissioned by the Agency for Health Care Administration under the Florida Patient Safety Bill, and the reports and legislation can be reviewed at [http://umdas.med.miami.edu/MPSC/MPSC\(E\).asp](http://umdas.med.miami.edu/MPSC/MPSC(E).asp).

In 1999, release of the IOM Report “*To Err is Human*” generated enormous interest in patient safety.² It highlighted that many health care errors are preventable. Since then, proposals have been made by Congress and the Administration to implement the IOM recommendations, and several Congressional hearings have fueled debate on the subject. Leading medical journals have devoted articles, editorials, and entire issues to this problem. Patient safety has become a defined priority on the nation’s public health agenda.³ Recent US Senate and House bills have included policies to reduce injuries and deaths caused by medical errors and protect reporting of adverse events.

Health care is a risky business. Simply being in an acute hospital in Florida carries, on average, a 200-fold greater risk of dying from the care process than being in traffic, and a 2000-fold greater risk than air travel. Routine medical care can cause patient harm (iatrogenic injury) by preventable system failure or human error, yet we have been slow to recognize and admit this. The dramatic rise of patient safety as a national health policy issue has stimulated dialogue about systems redesign, culture change, and changes in medical education. Still, many health professionals worry that the public views most errors occurring in health care as malevolent or negligent acts, rather than as errors resulting from system break-downs.

A need for standardized definitions

Every day, tens if not hundreds of thousands of errors occur in the US health care system. Fortunately, most do not result in serious harm, but in “near misses.” In the emerging study of health care errors, many definitions are used and common terminology has yet to emerge. The term “iatrogenic injury” has acquired a broader meaning, and is now considered to include unintended or unnecessary harm or suffering arising from any aspect of health care, encompassing problems arising from acts of omission and those from acts of commission. One of the problems in addressing patient safety is imprecise taxonomy, since the terminology has implications for how problems related to patient safety are addressed, and can

“Every day, tens if not hundreds of thousands of errors occur in the US health care system. Fortunately, most of these errors do not result in serious harm, but in “near misses.”

complicate comparison of different studies and reports. The lack of a standardized nomenclature and universal taxonomy for adverse events in Florida complicated the development of a response to issues outlined in the IOM report. Providing standardized definitions is a key deliverable of the Patient Safety Corporation.

Adverse and near miss event reporting systems

A key goal of mandatory patient safety reporting systems is to hold institutions and individual providers accountable to patients and the public for their actions. In contrast, voluntary reporting systems primarily focus on finding the causes of events and identifying solutions. There is a continuum of incidents ranging from apparently trivial near misses to catastrophic full-blown adverse events. Human fallibility

“Human fallibility is not the result of some divine curse or design defect, but rather the debit side of a cognitive balance sheet standing heavily in credit.”

is not the result of some divine curse or design defect, but rather the debit side of a cognitive balance sheet standing heavily in credit. The conditions that precede adverse events and near misses are identical. Only the presence or absence of recovery mechanisms determines the actual outcome, and focusing on near miss data can add more value to quality improvement than solely focusing on adverse events.

Schemes for reporting near misses as well as adverse events have been institutionalized in aviation, nuclear power, the petrochemical and steel industries, and in military operations. Health care has lagged behind these industries. However, in the last five years, there has been a concerted effort to create medical near-miss incident reporting systems to supplement the limited data available from mandatory systems that focus on preventable deaths and serious injuries.

Near-miss reporting systems contain data of preventive value. They have other advantages, offering powerful reminders of system hazards and the need to be concerned about error, while reducing practitioners' concerns about fear of reprisal. There is need for both mandatory and voluntary reporting systems, providing they are distinct, their goals are clearly defined, and their functions are separate.

The understanding that adverse events are a common and expected result of using complex systems has led to new methods of improving safety. The recognition that adverse events often result from poor system design has contributed to the development of reporting systems that allow adverse events to be collected and analyzed to determine whether there are root causes leading to patterns of adverse events. Reporting systems must allow reporters to feel "safe" and confident that their reporting will lead to a meaningful change in the system. These systems are only a part of a "culture of safety" that views adverse events as opportunities for learning and improvement rather than mishaps to be hidden. Experience in other industries

"For reporting to occur, it must be the right, easy and safe policy for health care professionals."

where errors are lethal or cause serious injuries, particularly aviation, suggests that confidential, voluntary "near miss" reporting systems can be invaluable in identifying systemic problems and providing information useful to improving safety.⁴ Findings demonstrate that adverse events occur from both human error and from systems failures, either as the result of poor design and/or poor maintenance.

For reporting to occur, it must be the right, easy, and safe policy for health care professionals. To maximize the usefulness of reporting events, there is a need to balance accountability, system transparency, and protections to reporters. The new Florida bill will critically look at the present mandatory reporting systems, while setting up an innovative near-miss reporting system.

Defining the core competencies of a patient safety curriculum

To promote safer health care in Florida, in-depth education of all health care professionals is required. Being serious about creating a technology savvy "culture of safety" requires a rethinking of how health professionals are educated. A large body of knowledge on patient safety must be integrated, translated, and embedded in practice to enable a sustained change in the behavior of individuals and organizations.

"A large body of knowledge on patient safety must be integrated, translated, and embedded in practice to enable a sustained change in the behavior of individuals and organizations".

Educational curricula will need to incorporate information about systems and broad perspectives on event analysis, human factors, teamwork, safety science, improvement culture, and professionalism.⁵ Teaching tools should include multi-media presentations, small group facilitated discussions, problem-based learning, and simulation-based exercises with video feedback. The curriculum must be based on adult learning principles, incorporating a multi-disciplinary, experiential, simulation-based modules and team training.

The Florida patient safety curriculum was designed by employing qualitative collection approaches (semi-structured interviews, document review, and a consensus conference), using a purposive sample of patient safety experts. The Patient Safety Corporation assembled a multi-disciplinary patient safety consortium from the Universities of Florida, Central Florida, Miami, South Florida, Florida State University, Nova Southeastern University College of Osteopathic Medicine (NSU-COM) and other healthcare organizations. The primary goal was to recommend a patient safety curriculum that could be broadened into a state-wide or national model.

The Corporation reviewed print, multimedia, and Internet sources of curricular information on patient safety. In addition, semi-structured interviews based on a survey tool were used to query 36 state, national, and international experts on patient safety education. Finally, we convened an international conference of more than 80 experts representing multiple disciplines to assess, collate, and synthesize currently available knowledge about patient safety teaching. Experts from medicine, nursing, the pharmaceutical industry, information technology, and the fields of simulation and curriculum design helped produce a framework and recommendations for teaching patient safety in Florida's health care schools and continuing education courses. IRB approval was received for interview portions of the study. The results of this process are shown in **Exhibit 1**. The findings also showed that while there is some teaching of quality improvement, there is little formal teaching on patient safety. Patient safety requires motivated teaching and life-long learning.

Exhibit 1 Results of the Interviews Conducted by Florida Patient Safety Corporation

1. An effective patient safety curriculum is consistent with high-quality, comprehensive health care education;
2. Patient safety curricula should be required in all health care professional schools;
3. Integrated multi-disciplinary team training should include patients and families as team members on a level playing field;
4. Patient safety teaching that uses transparent, honest communication and actively adopted best practices can encourage open disclosure of adverse events;
5. Optimal health care education should use information technology tools such as interactive web-based courses and web-casting, while also focusing on the other dimensions of formal, informal and unconscious learning patterns within a “culture of safety;” and,
6. Patient safety subject matter should include material about systems and broad perspectives on event analysis, human factors, teamwork, safety science, and improvement culture.

Engineering a culture of safety

A vital question to the educational community involves how the culture of “blame and resistance” that exists in many residencies could be transformed into one of learning to enhance patient safety. System awareness is key to changing the present mindset.⁶ Understanding the balance of barriers and incentives to adverse event reporting is an important first step. It will be essential to introduce norms that inculcate a

“It will be essential to introduce norms that inculcate a learning-based, non-punitive safety reporting culture in professional schools and graduate training programs, with support from consumers, patient advocacy groups, regulators and accreditors.”

learning-based, non-punitive safety reporting culture in professional schools and graduate training programs, with support from consumers, patient advocacy groups, regulators and accreditors. A certain amount of trial-and-error learning

will be necessary. Legal protection for reporters will need to be reinforced, as it has been in Australia and New Zealand, where protected incident reporting systems have been successful in gaining acceptance and credibility. The sum of barriers and incentives can be considered in terms of their impact on individuals, organizations, and society. Powerful disincentives to reporting are part of the organizational culture in many settings. They include skepticism, lack of trust, fear of reprisals, and lack of effective reporting structures.

Conclusions

How do we create an environment in academic medical centers that fosters safety? National cultures arise largely out of shared values, but organizational culture also is shaped by shared practices. Acquiring a safety culture in an academic medical center involves collective learning, with strong support from the leadership. Common reactions to adverse incidents include “Write another procedure,” and “Blame and train.” They do not make the system more resistant to future incidents, but

“What is needed is a “just culture”, where an atmosphere of trust is encouraged and rewarded, and where a line is drawn between acceptable and unacceptable behavior.”

they deflect the blame from the organization as a whole. At the same time, a “no blame” culture is neither feasible nor desirable. A few adverse events are egregious (substance abuse, sabotage etc.) and warrant sanctions, and blanket amnesty on all unsafe acts would reduce credibility in the eyes of the public. What is needed is a “just culture,” where an atmosphere of trust is encouraged and rewarded, and where a line is drawn between acceptable and unacceptable behavior.

Today’s crisis in health care is more than just a crisis of patients and doctors, but also a crisis involving patients’ families and the general public. The professionals and organizations operating in health care have been called “stakeholders,” yet consumers and those who ultimately pay for health care, and for the societal costs of errors, also figure quite prominently. The fact that consumers have not been considered nor considered themselves as stakeholders in health care is one of the problems that have obstructed maintenance of quality and the promotion of patient safety.

The Corporation's report suggests that patient safety in Florida is a topic of critical interest to the general public, and one that must be addressed by the state's citizens. The results of this effort are shown at **Exhibit 2**. Despite much work in the area of health care outcomes, there are indicators that a segment of patients suffer unnecessary adverse events. Opportunities exist to profoundly influence the "safety" of health care delivery by changing the educational environment of academic medical centers, including their curricula, teaching methods and culture. The experts interviewed for this project clarified opportunities as well as barriers, and highlighted the elements needed to fundamentally transform education to create safety-conscious health care providers and patients. Adoption of patient safety knowledge by leading health education groups has been slow. Information systems and technologies are available to improve the educational process, but presently are not fully implemented. Simulation, successfully employed for years in aviation, can facilitate patient safety teaching. Team-based learning, in simulated or controlled real-time situations, emphasizes cooperation in a context of systems-based care.

Florida's patient safety initiative can help foster a culture of safety for all health care professionals. It is especially valuable for medical residents, creating a learning environment that fosters safe care by implementing a dedicated safety curriculum and creating a supportive environment. If fear of litigation continues to impede efforts to improve patient safety and quality, the transformation to a culture of safety may not materialize. It is likely that aspects of this problem can only be addressed through public action. Fostering trust, honesty, and respect between consumers and providers, patients and health care professionals, and among the health care disciplines, will empower patients and health care providers alike. ■

Florida Patient Safety Recommendations adopted in the Health Affordability Act, April 2004.

- Recommendation 1: Create and endow a Florida Patient Safety Corporation (PSC)
- Recommendation 2: Create a protected Near Miss Voluntary Incident Reporting System
- Recommendation 3: The PSC should collate, organize, stratify, and promulgate "best practice" information to promote quality information and patient safety
- Recommendation 4: The PSC should design and define the essential knowledge, skills and attitudes regarding safety and quality in health care, as well as promote simulation and team training
- Recommendation 5: The PSC should study alternatives to the current medical liability and accountability practices including evaluating no-fault medico-legal systems while adhering to reasonable and ethical medico-legal standards and practices
- Recommendation 6: The PSC will formulate and encourage wide-ranging and unique research producing methodology for both enhancing safe medical practices and developing the metrics for assessing patient safety

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